

What is claimed is:

1. A process for the purification of a crude propene oxide containing methanol and acetaldehyde by a continuously operated extractive distillation in a distillation column having a feeding point for the crude propene oxide, comprising:
 - a. feeding an extraction solvent to the distillation column at a point of said column above the feeding point of the crude propene oxide in an amount effective for lowering the volatility of methanol relative to the volatility of propene oxide,
 - b. feeding a compound containing an unsubstituted NH_2 group and capable of reacting with acetaldehyde under the conditions of distillation to form compounds with a boiling point higher than that of propene oxide to the distillation column at a point above the feeding point of the crude propene oxide or admixing said compounds with the crude propene oxide feed to the distillation column and
 - c. withdrawing a purified propene oxide from the distillation column at a position above feeding points of the extraction solvent and the compound containing an unsubstituted NH_2 group.
2. The process of Claim 1, wherein
the crude propene oxide contains more than 1% by weight methanol and more than 200 wppm acetaldehyde.
3. The process of Claim 1, wherein
the purified propene oxide contains less than 100 wppm methanol and less than 100 wppm acetaldehyde.
4. The process of Claim 3, wherein
the purified propene oxide contains less than 50 wppm methanol and less than 50 wppm acetaldehyde.

5. The process of Claim 1, wherein said column has a top and the purified propene oxide is withdrawn at the top of the column.
6. The process of Claim 1, wherein a mixture of the extraction solvent and a compound containing an unsubstituted NH_2 group is fed to the distillation column.
7. The process of Claim 1, wherein the extraction solvent is selected from the group consisting of water, propylene glycol, 1-methoxy-2-propanol, 2-methoxy-1-propanol and mixtures thereof.
8. The process of Claim 7, wherein the extraction solvent is water.
9. The process of Claim 1, wherein the compound containing an unsubstituted NH_2 group is selected from the group consisting of hydrazine, hydrazine monohydrate and hydrazinium salts.
10. The process of Claim 6, wherein the mixture is an aqueous hydrazine solution containing from 0.5 to 5% by weight hydrazine.
11. The process of Claim 1, wherein the molar ratio of the compound containing an unsubstituted NH_2 group relative to acetaldehyde is in the range from 0.5 to 2.
12. The process of Claim 1, wherein the mass ratio of the extraction solvent feed relative to the amount of methanol contained in the crude propene oxide feed is in the range from 0.1 to 10.
13. The process of Claim 1, wherein the crude propene oxide is mixed with an aqueous alkaline solution and the mixture is reacted for 1 to 200 minutes, at a temperature from 20 to 100°C before feeding it to the extractive distillation.

14. The process of Claim 13, wherein the mixture is reacted for 1 to 30 minutes.

15. The process of Claim 13, wherein the aqueous alkaline solution is 0.1 to 2% by weight aqueous sodium hydroxide.

16. The process of Claim 13, wherein the molar ratio of hydroxide ions introduced with the aqueous alkaline solution relative to the amount of methyl formate contained in the crude propene oxide feed is in the range from 1.1 to 4.

17. The process of Claim 13, wherein the mixture is reacted in a tubular reactor.

18. The process of Claim 13, wherein the purified propene oxide contains less than 50 wppm methanol, less than 50 wppm acetaldehyde and less than 100 ppm methyl formate.

19. A process for the catalytic epoxidation of propene comprising:

a. in a reaction step reacting the propene with aqueous hydrogen peroxide in methanol in the presence of a titanium silicalite catalyst to obtain a product stream,

b. optionally passing the product stream from the reaction step to a pressure release step, and

c. separating the product stream in a pre-evaporator having less than 20 theoretical separation stages into an overhead product containing propene, propene oxide and methanol, and into a bottom product containing methanol and water, 20 to 60% of the total amount of methanol introduced with the product stream being removed with the overhead product and residue remaining in the bottom product,

d. at least partially condensing the overhead product from step c and optionally stripping propene and any propane present to give a condensate containing propene oxide, more than 1% by weight methanol and more than 200 wppm acetaldehyde,

e. subjecting the condensate from step d to an extractive distillation according to Claim 1, whereby a bottom product containing methanol and the extraction solvent is obtained, and

f. recycling all or a part of the bottom product from step c optionally after partially removing water to the reaction step a.

20. The process of Claim 19, further comprising:

combining the bottom product from step c and the bottom product from step e to obtain combined products and subjecting the combined products to a catalytic hydrogenation and recycling all or a part of the resulting product optionally after partially removing water to the reaction step a.